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Salomons, R.M.; Grootveld, H.

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# **The Equity Risk Premium:**

## **Emerging versus Developed Markets**

Roelof Salomons and Henk Grootveld \*

SOM theme E: Financial markets and institutions

### **Abstract**

This paper gives an empirical view of the ex-post equity risk premium in a number of international markets with special attention to emerging ones. Our study yields interesting implications for finance. Firstly, we find that the equity risk premium in emerging markets is significantly higher than in developed markets. Secondly, the extent to which emerging stock markets reward investors is varying through time. We cannot link this time varying nature with the presence of a structural break based on stock market liberalisations, but observe that the differences are of a more cyclical nature.

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\* Salomons is at University of Groningen and AEGON Asset Management, The Netherlands. Grootveld is at Robeco Group, The Netherlands. Correspondence: [r.m.salomons@eco.rug.nl](mailto:r.m.salomons@eco.rug.nl)

## 1. INTRODUCTION

Investing in equities hopefully provides investors a return that exceeds the risk free rate of return. The difference between the two is also known as the equity risk premium, or ERP. The average long-term ERP exceeds the level that classical equilibrium theory predicts. Mehra and Prescott [1985] showed that for the US in the period 1889-1978 the ERP has been in excess of 6% per annum. In a consumer CAPM framework this corresponds with a level of relative risk aversion of 26. This is far higher than experimental theory predicts; values between 1 and 10 can be seen as normal within this framework. Being incapable of associating the measured risk with the observed return, Mehra and Prescott dubbed the phenomenon the equity premium puzzle. Ever since, the issue caught the attention of academics as well as practitioners and spawned a whole new literature based on two classes of explanations for the existence of the ERP puzzle: theoretical and empirical. This paper is a contribution to the empirical research.<sup>1</sup>

From the empirical side Siegel [1992] extends the Mehra-Prescott sample to 1802-1990 and observes an ERP of 5.3% per annum over the entire period. Moreover, early stock returns did not exceed the risk free rate of return by nearly the same magnitude as they did in recent data. Brown, Goetzmann and Ross [1995] and Goetzmann and Jorion [1999] suggest the high equity premium in US equities to be the exception rather than the rule. They hint at the issue of survivorship bias by only observing the US, a clear survivor in a turbulent century. Blanchard [1993], Fama [1997] and Dimson, Marsh and Staunton [2001] show the robustness of the puzzle by studying a number of developed countries. Fama finds the theory to be even more at odds with reality for Belgium, France, Germany, The Netherlands, and the UK in the post-war period compared to those in the US. This, however, still does not completely resolve the issue of survivorship bias.

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<sup>1</sup> For an excellent discussion of the theoretical literature we refer to Kocherlakota [1996].

Empirical finance has mostly focussed on advanced markets and exchanges. We aim to extend the analysis to include emerging markets. Among others, Bernartzi and Thaler [1995] and Campbell and Cochrane [1999] claim that the high equity risk premium in the US was necessary to entice people into the market. Where does this leave us for emerging markets? As emerging markets are perceived to be more risky, one would expect a higher incentive. Barry, Peavy and Rodriguez [1997] and Claessens, Dasgupta and Glen [1995] have shown that investing in emerging markets is beneficial in a risk/return framework. These papers and numerous others claim that investors are compensated for bearing the risks in terms of higher average returns and a low correlation with developed markets and among other emerging markets. We leave aside the issue of diversification to focus specifically on return and test whether the perceived risk is reflected in larger ERP for emerging markets. In this paper we provide differences and similarities of the ex-post ERP for emerging markets compared to developed markets and show that the ERP is significantly higher in emerging markets.

Moreover, we examine the time varying nature of the ERP in emerging markets and attempt to explain the differences in ERP we observe by building on economic literature. If emerging markets become more developed one would expect a structural change in the equity risk premium. It is hard to present evidence for a change in level, also by studying the cross-section of emerging markets ERP. As equity markets in emerging countries are perceived to be of higher risk, one might also expect that the changes in global business cycle have some form of explanatory power over their risk premium. We show that the time variation in ERP for the emerging market asset class tend to be of a cyclical nature.

In the next section, we start by giving a description of the data. Section 3 contains our main testing results and examines the economic case for observed differences. Section 4 concludes.

## **2. DESCRIPTION OF DATA**

With regards to data and interpretation of the data, we encountered some standard emerging market problems. Firstly, performance results for emerging markets are unfortunately not available for such extended periods as for large developed countries. Moreover, the data tends to be rather volatile. Consequently, we do not have the luxury of drawing conclusions from long term empirically validated relations. Secondly, the quality and availability of the data is sometimes wanting. Thirdly, regime shifts during the sample period might complicate the interpretation of empirical results over the entire sample period. Currencies used to be fixed, but flexible exchange rate systems are now common in many emerging economies. These factors prevent us from drawing very strong conclusions.

We use Morgan Stanley Capital International, MSCI, indices for developed equity markets and rely on International Financial Corporation, IFC, indices for emerging markets. All returns are monthly total returns denominated in US dollars. Data on risk-free rate of return are from the International Financial Statistics, IFS, database at the International Monetary Fund. We rely on the US monthly money market rate. Data on industrial production and leading indicators is from the Organisation for Economic Cooperation and Development, OECD. The emerging market countries listed in Table 1 are selected because they represent markets at which investors tend to focus. Besides that, they don't have large barriers obstructing investing and most of them have a sufficiently long history to make empirical results statistically valid. For the developed markets we evaluated the MSCI World, and furthermore, restricted our attention to the most developed, G7, countries.

The IFS data are available from January 1976 until December 2001. Equity market data for all developed markets start in January 1976. Not all emerging markets have data from January 1976 onwards. As time progresses gradually more countries are added to the database.

**Table 1: Index constituents**

<b>Developed Index</b>	<b>Emerging Index</b>			
<i>G7</i>	<i>Asia</i>	<i>Latin America</i>	<i>Africa/Middle East</i>	<i>Eastern Europe</i>
Canada	China	Argentina	Egypt	Czech Republic
France	India	Brazil	Israel	Hungary
Germany	Indonesia	Chile	South Africa	Poland
Italy	Korea	Colombia		Russia
Japan	Malaysia	Mexico		Turkey
United Kingdom	Pakistan	Peru		
United States	Philippines	Venezuela		
	Taiwan			
	Thailand			

The ERP is defined as the return on equity minus the risk-free rate of return:

$$ERP_t = R_t^e - R_t^f \quad (1)$$

Measured in local currencies would be the purest form of the equity risk premium, but this would be less interesting from the perspective of an international investor. We evaluate US\$ returns in developed and emerging markets versus US\$ risk-free rates of return. When portfolios are rebalanced, investors need to do currency transactions. So instead of being dependable on one variable, the market return, they depend on an extra stochastic variable, the currency. The impact of currency fluctuation is best illustrated by a Latin America example. In the period 1985-1990 Argentinean equities registered a 521% gain in US\$ term, in spite of suffering a huge currency depreciation against the dollar. In the 1990-1995 period equities in Brazil registered a local currency gain of 12,854,287% while it gained “only” 204% in US\$ terms. The distributional characteristics of the time series are in Tables 2-5. The higher returns and more volatile nature of emerging markets returns are evident.

- For the MSCI World we observe an annualised ERP of 1.8% over the period February 1988 – December 2001. For the US we find an ERP of 3.7% over the entire sample period, somewhat lower than the numbers documented in the literature. For

the same sample period, France and the UK carry higher numbers, which is consistent with the observation by Fase [1999]. The ERP in Germany is slightly lower than in the US. The differences between our numbers and the ones documented by Dimson, Marsh and Staunton [2001] are most likely due to calculation in US\$ terms and different data sources. We have included the most recent years in our data, years in which investors were not that much rewarded. Although the numbers differ in terms of magnitude, results are nonetheless very similar in direction and ordering. On an equal weighted basis, the annualised ERP of the G7 countries was 3.6% over the entire sample.

- The market capitalisation weighted IFC index for emerging markets has an annualised ERP of 3.1% for the period January 1985 – December 2001. Cross-sectional variation of ERP is large for emerging markets, which indicates that some markets have offered a better compensation for risk than others. In some markets, most notably Egypt, Indonesia and Pakistan, the ERP is even negative over the sample period. On an equal weighted basis, the annualised ERP of the emerging markets was 12.7% for the entire sample.

A reasonable assumption is that investors exhibit decreasing absolute risk aversion; hence they tend to have a preference for positive skewness.<sup>2</sup> The negative skew and higher (excess) kurtosis in developed markets is also observed by Bekaert, Erb, Harvey and Viskanta [1998]. Clearly the ERP data for all observed markets are not normally distributed. Following Jarque and Bera [1980] we have tested for non-normality and the test results confirm the observation that equity premia are non-normally distributed.<sup>3</sup> This is true for all individual G7 and emerging markets.

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<sup>2</sup> See Kraus and Litzenberger [1976].

<sup>3</sup> Test statistics are not reported in the table, but available on request.

Time series analysis of return series in emerging markets highlights the presence of substantial autocorrelation. The literature points toward predictability of emerging market returns (e.g. Harvey [1995] and Bekaert, Erb, Harvey and Viskanta [1997]). The Ljung and Box [1978] statistic is used to test for several orders of autocorrelation in the ERP series. We find a alternating sequence of autocorrelation in the IFC index: positive first order autocorrelation, negative autocorrelation at lags above one year and positive again at lags near three years. No significant positive or negative correlation can be detected for the MSCI index. The equally weighted indices, which cover a substantially longer time period, display similar behaviour and the same holds for the set of individual countries within developed and emerging markets. The ERP is emerging market is more predictable and has the tendency to mean revert in the data examined.<sup>4</sup>

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<sup>4</sup> This mean reversion is at much shorter lags than indicated in work by DeBondt and Thaler [1985].



**Table 2: Distributional characteristics of the monthly ERP of Developed Markets, denominated in US\$.** Table shows sample period, number of observations, mean, standard deviation, skewness, kurtosis, median and corresponding z-value, minimum and maximum.

	Canada	France	Germany	Italy	Japan	UK	US	MSCI	G7 (equal)
	1/76 - 12/01	1/76 - 12/01	1/76 - 12/01	1/76 - 12/01	1/76 - 12/01	1/76 - 12/01	1/76 - 12/01	2/88 - 12/01	1/76 - 12/01
No.	312	312	312	312	312	312	312	167	312
Mean	0.14%	0.40%	0.28%	0.32%	0.32%	0.36%	0.30%	0.15%	0.30%
St. dev	5.73%	6.59%	6.01%	7.64%	6.69%	5.78%	4.36%	4.18%	4.38%
Skewness	-0.53	-0.14	-0.24	0.35	0.33	-0.02	-0.49	-0.41	-0.53
Kurtosis <sup>5</sup>	2.15	1.30	1.04	0.71	0.61	1.35	2.12	0.59	1.32
Median	0.33%	0.62%	0.39%	0.02%	0.01%	0.29%	0.52%	0.63%	0.40%
Min	-23.64%	-25.21%	-18.47%	-21.96%	-20.09%	-22.32%	-22.05%	-14.60%	-17.96%
Max	16.70%	25.31%	19.37%	30.18%	23.53%	21.65%	12.46%	10.37%	11.62%

<sup>5</sup> Kurtosis statistics detailed are excess kurtosis, i.e. the extent to which distributions have fatter tails than normally distributed variables (in which case it is 3).

**Table 3: Distributional characteristics of the monthly ERP of Emerging Markets, denominated in US\$.** Table shows sample period, number of observations, mean, standard deviation, skewness, kurtosis, median and corresponding z-value, minimum and maximum.

	Argentina	Chile	Colombina	Peru	Venezuela	Brazil	Mexico	Latam	IFC	GEM
	1/76 – 12/01	1/76 - 12/01	1/85 - 12/01	10/93 - 12/01	1/85 - 12/01	1/76 - 12/01	1/76 - 12/01	1/76 - 12/01	1/85 - 12/01	1/76 - 12/01
No.	312	312	204	99	204	312	312	312	204	312
Mean	3.16%	1.19%	0.75%	0.18%	0.91%	0.73%	0.99%	0.07%	0.25%	1.04%
St. dev	25.13%	10.23%	8.96%	8.48%	13.49%	15.73%	12.15%	10.42%	6.74%	6.32%
Skewness	2.36	0.91	1.16	0.43	0.00	0.49	-0.82	0.38	-0.56	-0.05
Kurtosis	11.39	3.82	3.19	3.14	2.44	1.47	3.44	3.01	1.66	1.38
Median	0.30%	-0.07%	-0.43%	-0.45%	0.01%	-1.03%	1.38%	-0.53%	0.68%	0.98%
Min	-65.69%	-28.94%	-20.85%	-29.07%	-50.75%	-57.72%	-59.92%	-34.41%	-26.01%	-28.32%
Max	177.10%	61.32%	36.79%	31.66%	46.87%	56.34%	38.96%	46.47%	18.91%	20.64%

**Table 4: Distributional characteristics of the monthly ERP of Emerging Markets, denominated in US\$.** Table shows sample period, number of observations, mean, standard deviation, skewness, kurtosis, median and corresponding z-value, minimum and maximum.

	Czech Republic	Hungary	Poland	Russia	Turkey	Egypt	Israel	South Africa	EMEA <sup>6</sup>	GEM
	1/94 - 12/01	2/97 - 12/01	1/94 - 12/01	2/97 - 12/01	1/87 - 12/01	2/97 - 12/01	2/97 - 12/01	1/94 - 12/01	2/98 - 12/01	1/76 - 12/01
No.	96	59	96	59	180	59	59	95	47	312
Mean	0.46%	2.00%	-0.13%	2.00%	2.15%	-2.54%	0.39%	-0.35%	-0.50%	1.04%
St. dev	11.83%	21.62%	13.22%	21.62%	20.11%	7.09%	7.56%	8.32%	7.62%	6.32%
Skewness	0.56	-0.20	0.22	-0.20	0.85	1.03	-0.64	-0.63	-1.15	-0.05
Kurtosis	2.99	1.35	1.33	1.35	1.18	1.07	0.06	2.38	3.01	1.38
Median	0.38%	3.64%	0.14%	3.64%	-1.34%	-3.25%	1.33%	-0.17%	0.90%	0.98%
Min	-38.65%	-62.95%	-38.07%	-6 2.95%	-41.11%	-13.15%	-19.59%	-33.52%	-28.75%	-28.32%
Max	43.83%	57.99%	38.36%	57.99%	70.86%	18.59%	14.07%	21.10%	14.96%	20.64%

<sup>6</sup> EMEA is abbreviation for Eastern Europe, Middle East and Africa.

**Table 5: Distributional characteristics of the monthly ERP of Emerging Markets, denominated in US\$.** Table shows sample period, number of observations, mean, standard deviation, skewness, kurtosis, median and corresponding z-value, minimum and maximum.

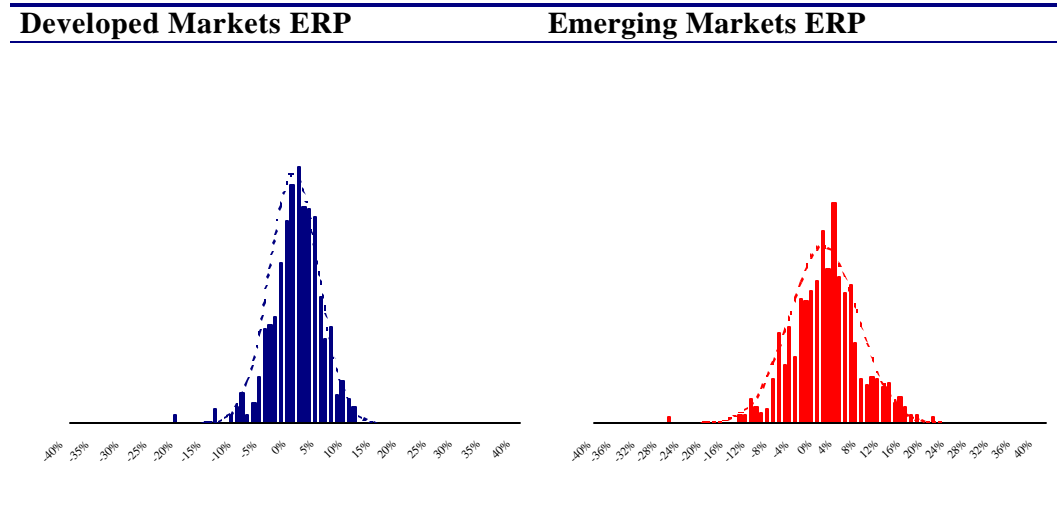
	China	India	Indonesia	Korea	Malaysia	Pakistan	Philippines	Taiwan	Thailand	Asia	GEM
	11/93 - 12/01	1/76 - 12/01	1/90 - 12/01	1/76 - 12/01	6/95 - 12/01	6/95 - 12/01	1/85 - 12/01	1/85 - 12/01	1/85 - 12/01	1/85 - 12/01	1/76 - 12/01
No.	98	312	144	312	78	78	204	204	204	204	312
Mean	0.67%	0.34%	-0.68%	0.51%	-0.92%	-0.92%	-0.14%	1.09%	1.28%	0.18%	1.04%
St. dev	13.87%	8.11%	14.38%	11.24%	13.15%	13.15%	9.52%	11.11%	13.32%	7.46%	6.32%
Skewness	3.93	0.53	0.46	1.17	1.15	1.15	0.70	0.71	0.63	-0.14	-0.05
Kurtosis	25.96	1.33	2.23	4.97	4.17	4.17	3.78	2.59	1.87	1.00	1.38
Median	-0.43%	0.02%	-1.44%	-0.80%	-1.02%	-1.02%	-0.81%	0.44%	0.15%	0.27%	0.98%
Min	-20.93%	-24.71%	-40.57%	-34.01%	-31.80%	-31.80%	-35.65%	-30.06%	-36.11%	-25.96%	-28.32%
Max	99.28%	34.90%	54.35%	68.02%	53.14%	53.14%	35.45%	46.50%	52.76%	24.05%	20.64%

### 3. EMPIRICAL RESULTS

The starting point to compare the equity risk premium in emerging markets with developed markets is to evaluate the indices. We construct equally weighted indices for both developed (G7) and emerging (GEM) markets. This makes it possible to have longer history available and reduces the impact of country specific issues. An equal weighting scheme has the advantage that the index is not skewed to large markets, which in the extreme, would boil down to comparing the US with the largest emerging markets. Hence the impact of survivorship bias, as suggested by Brown, Goetzmann and Ross [1995] and Goetzmann and Jorion [1999], is somewhat limited. Distributional characteristics are shown in Tables 25. Both ERP series for emerging and developed indices are non-normally distributed. Figure 2 presents the distribution of ERP indices in US\$ returns and clearly shows higher volatility, difference in skewness and fatter tails for the emerging market equity risk premium.

Besides the issue of diversification, conventional wisdom is that emerging markets compensate investors for the inherent risks in terms of high average returns. But is this really the case in practice? To answer this question we have split up this section into two subsections that will each cover a different subject. First, we will investigate the statistical difference between the ERP in emerging and developed markets on a one-month horizon. Second, we study the time varying behaviour of ERP data to test for the presence of cycles or breaks in the data. We will touch on differences between markets in our sample and show that some markets have been rewarding investors for the perceived risk, whereas others have clearly not.

**Figure 1: Distributions for monthly equity risk premia developed and emerging markets in US\$ for Jan 1976 - December 2001.** Both graphs have similar scale and are based on an equal weighted index of developed and emerging markets respectively.



### 3.1 Short-term equity risk premium

Having constructed the indices and observed the data we can test for differences and similarities in the equity risk premium of emerging compared to developed markets. On the basis of our equally weighted indices we accept the hypothesis of a larger ERP for emerging markets compared to developed markets at a 5% significance level. Table 6 gives the corresponding statistics. Calculating a Sharpe ratio, i.e. adjusting the ERP for standard deviation, also shows higher Sharpe ratios for emerging markets.

**Table 6: Statistics for differences in ERP between developed and emerging markets.** Table gives the mean and median values of both developed and emerging indices denominated in US\$ ERP. The final column gives statistics for differences between emerging and developed ERP. It also shows the Sharpe and Sortino ratios for the equal weighted indices.<sup>7</sup> The sample period is 1976-2001.

Equal Weighted Returns	Developed index	Emerging Index	Test for difference
Mean	0.30%	1.04%	t = 1.7
Sharpe	0.24	0.57	
Median	0.40%	0.98%	z = 1.8
Sortino	0.42	0.87	

Because of the nature of the data it is not sufficient to test only for difference in mean values. As the distributions are far from normal we test for differences in median as well. Based on Wilcoxon tests on differences in median values, median values are statistically significantly higher in emerging markets.

Within finance, investment risk is commonly defined by standard deviation, which has one major drawback. Standard deviations measure uncertainty or variability of returns but in some cases this does not match one's intuition about risk. Large positive outcomes are treated as equally risky as large negative ones. In practice, however, positive outliers should be regarded as a bonus and not as a risk. It is therefore better to look at some measure of downside risk.<sup>8</sup> We calculate downside standard deviation, semi deviation for short, for both indices and show Sortino ratios in Table 3. Emerging markets contain more downside risk, measured by semi deviation, in comparison to developed markets. The change in risk is not enough to alter the conclusion that investors are rewarded with higher ERP. However, we note that in the cross-section of markets using

<sup>7</sup> We calculate Sharpe and Sortino ratio by annualising the mean and standard deviation, respectively semi deviation.

<sup>8</sup> Downside risk measures were introduced by the "Safety First" criterion from Roy [1952]. Bawa [1975] and Fishburn [1977] introduced downside risk in the expected utility framework. A practical implication of downside variance for asset management is provided in Sortino and Van der Meer [1991]. See Grootveld and Hallerbach [1999] for an overview of downside risk measures with their theoretical and practical properties.

semi deviation or standard deviation makes for substantial differences in risk. In Argentina, the annualised semi deviation is 87.0% versus standard deviation of 70.7%. As a stark contrast we highlight the US where semi deviation of 8.8% is combined with a standard deviation of 15.1%. Investment decisions based on Sharpe and Sortino ratios would be different.<sup>9</sup>

Another risk measure that differences between the upside potential and downside risk is the shortfall probability. It regards the probability of defeat by a benchmark at the end of the investment horizon. In shortfall terminology, we are interested in the probability that the ERP of emerging markets is lower than developed markets. Shortfall probabilities are 49%. Based on a Wilcoxon test, there is no statistically significant difference between emerging markets and developed markets ERP. So the probabilities of a lower ERP in emerging markets do not differ substantially from developed market at short horizons. The point is that this tells us the probability of a disastrous event, but in itself does not tell us the damage it causes.<sup>10</sup>

Using downside risk measure is revealing as it lays bare the “true” risk of investing in emerging markets. In general investors are rewarded with higher return, but if things go wrong, the damage can be severe and detrimental to performance.<sup>11</sup> The next section, which will study the time varying nature of emerging ERP, highlights this issue.

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<sup>9</sup> In general and in line with the distributional characteristics, we observe that the difference between semi deviation and standard deviation are more pronounced in developed markets.

<sup>10</sup> This observation becomes even more relevant as longer investment horizons. As investors in emerging markets in practice do not invest for just one month, we studied longer horizon ERP. At longer horizon the shortfall probabilities decrease more rapidly in emerging markets than they do in developed markets.

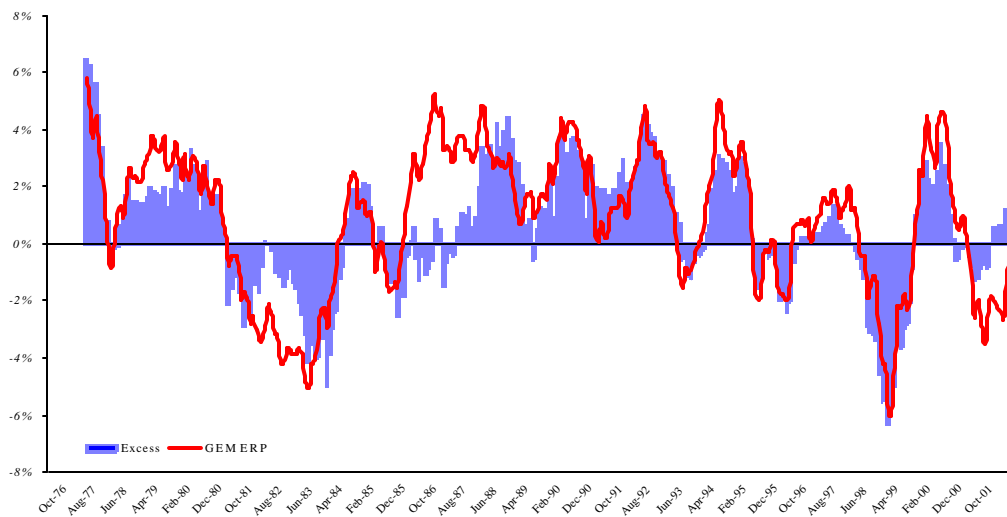
<sup>11</sup> Precisely this observation has led Estrada [2000] to advocate using downside risk for emerging markets.



### 3.2 Time-varying nature of ERP

We have learned from Bekaert, Erb, Harvey and Viskanta [1998] that the structure of the return distribution of emerging markets is potentially unstable. Distributional characteristics of ERP in Table 2-5 confirm this observation. It is clear that ERP tends to be less stable through time in emerging markets as Figure 2 shows. As shown, in general the environment for emerging market investing has been rather rewarding with one period, 1985-1994, clearly standing out. One is able to observe the correlation between the ERP in emerging markets and the difference between ERP in emerging markets compared to developed market, the excess ERP.

**Figure 2: Emerging market ERP.** The line in the graph shows the emerging market ERP after applying a twelve-month moving average filter. The bars are the differences between the ERP in emerging markets compared to developed markets, the excess ERP.



The detrimental effects of major emerging market crisis can be spotted quite easily and serves to show the extent to which downside risk is revealing. The first period in which emerging markets were delivering substantial negative ERP was in the beginning of the 1980s. This period was marked by the Latin America debt crisis erupting in 1982. The reliance on cheap, mainly short term, foreign capital to finance current account deficits came to the fore when investors became to realise that Mexico would not be able to payback its loans.<sup>12</sup> The second crisis period began in 1995 with Mexico (widely known as the Mexican Tequila crisis) and continued in Asia in 1997-1998. Especially the latter period resulted in severely negative ERP in our sample period. A round of depreciation that started in Thailand in July 1997, culminated almost one year later in the default of Russia. In retrospect, the crises of the 1990s were due primarily to a combination of unsustainable current account deficits, excessive short-term foreign debt and weak domestic banking systems. Over enthusiasm prior to 1994 had made emerging markets vulnerable and the crisis exposed the macroeconomic imbalances. The firm belief in economic miracles ended abruptly.<sup>13</sup>

We aim to find economic explanations for the time-varying nature of the ERP by distinguishing structural and cyclical changes.

- The literature emphasizing structural elements suggests that changes in economic structure and increased reliance on a market-style economy leads economies to be more integrated in the global economy. Bekaert [1995], Stulz [1999] and Henry [2000] claim that as markets get more liberalised and integrated, the cost of capital decreases because the removal of investment barriers allows for risk sharing. Rational investors should consider that the integration process might lower the

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<sup>12</sup> See Pastor [1987].

<sup>13</sup> Feldstein [2002] gives an excellent assessment of emerging market crises and shows that the crisis of the 1980s is a “standard” balance of payment crisis whereas the crisis of the 1990s is a combination of balance of payment and financial crisis. The interaction of the two made the effects so devastating (Krueger [2002]).

required risk premium (lower expected returns) and increase correlation between emerging markets and developed markets. Bekaert [1995] details that many of the capital market liberalisations, that investors tend to welcome, occurred in early 1990s. Henry [2000] lists all dates and type of market liberalisation by country. The hypothesis we test is that liberalisations and reforms cause markets to become less emerging (more developed) and result in lower level of ERP.

- The cyclical explanation is based on the view that the global business cycle is the main force behind the time varying nature of the ERP in emerging markets. This approach is related to the fact that emerging economies are heavily exposed with the global business cycles and that investors might see emerging markets as a “leveraged play” on the global cycle, i.e. high beta markets. The first part of this view finds support in publications by the International Monetary Fund [2001] and Frankel and Roubini [2002]. The most visible channel of transmission is trade. Export revenue is key to the ability of emerging markets to service debt. Demand for the types of goods that emerging countries produces tends to be procyclical. Frankel and Roubini [2002] estimate in a simple regression (for the period 1977-1999) that every one percentage point increase in G7 growth raises the growth rate in emerging markets by 0.78 percentage points. Recent literature focuses on the key factors that might explain the extent of output co-movement between advanced and developing economies.<sup>14</sup> The hypothesis we are interested in is whether cyclical patterns in ERP correlate with global business cycle.

### **Structural aspect on emerging market ERP**

As the test for a change in level of ERP due to structural changes we follow the Bekaert [1995] suggestion and split the data into two sub-samples with same number of data

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<sup>14</sup> See IMF [2001] for references on literature that focuses on the three main transmission channels for macroeconomic fluctuations: 1) trade, 2) finance and 3) direct sectoral linkages.

points: 1978-1989 and 1990-2001.<sup>15</sup> We tested for differences between markets and between sample periods and displayed statistics in Table 9. The ERP in emerging markets is not significantly lower in the former period (1978-1989). Contrary to Bekaert, Erb, Harvey and Viskanta [1998], who observe a drop in the degree of volatility of equities in 1990s versus the 1980s, we find similar levels of volatility. Lower volatility in Latin America is outweighed by much higher volatility of Asian equity markets. No difference can be observed for developed markets between the two sample periods either. Nor is there a significant difference between ERP in emerging and developed markets. Although there might be problems with the nature of the data, this points to no impact of structural changes on the level of ERP.

**Table 7: Sub samples of equity risk premium for Jan 1978 - Dec 2001.** Table gives the mean values of both developed and emerging indices denominated in US\$ ERP. The final column gives statistics for differences between emerging and developed ERP. Differences between sample periods are in final row.

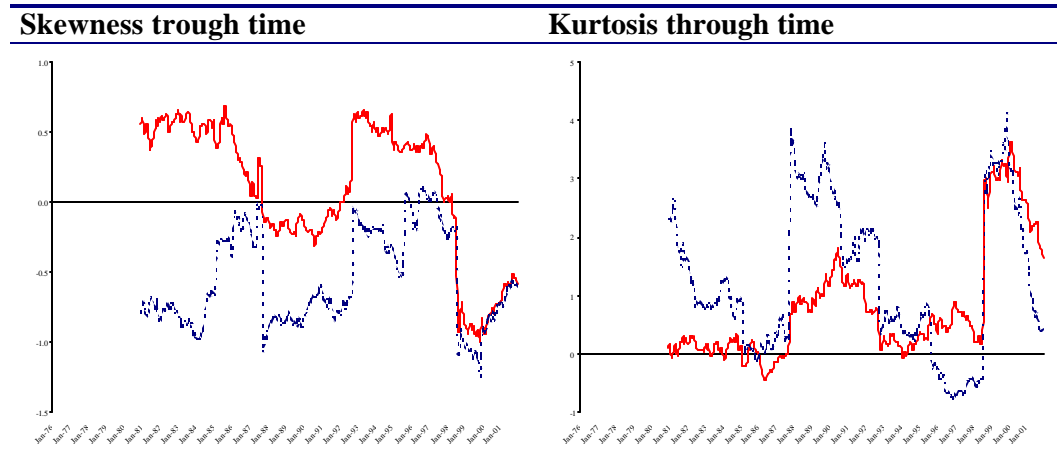
Local Returns	Developed index	Emerging Index	Test for difference
Mean (1978-89)	0.65%	1.14%	t = 0.80
Mean (1990-01)	0.06%	0.54%	t = 0.76
Test for difference	t = 1.14	t = 0.83	

To be more conclusive we study higher moments of the distribution. Following Bekaert, Erb, Harvey and Viskanta [1998] we explore the time series pattern of emerging markets skewness and kurtosis more carefully and compare those with developed markets. The transformation of emerging markets from a state of segmentation to a state of integration arguably changes the fundamental sources of risk and affects skewness and kurtosis. Liberalisations might be followed by discrete price hikes, inducing (temporarily) positive skewness and kurtosis. Following successful integration these should gradually

<sup>15</sup> We omit data from 1976 and 1977, years in which emerging market were rewarding, in order for the sample periods to be similar size. Including these observations and adjusting for different size of samples does not alter the results.

decrease. Figure 3 shows the behaviour of skewness and kurtosis of emerging markets ERP, contrasted to developed markets.<sup>16</sup>

**Figure 3: Distributional characteristics for monthly equity risk premia developed and emerging markets in US\$ for Jan 1976 - December 2001.** Both graphs show the five year trailing skewness and kurtosis of monthly US\$ ERP for developed and emerging markets. The thick lines display the series for emerging markets; dotted lines are for developed markets.



We show that favourable return characteristics of emerging markets differ by sample period, but find it hard to identify the effect of market integration and economic reform. We cannot find statistical evidence supporting the hypothesis that structural changes are causing changes in the level of ERP. However, we tend to feel that the emerging market crises that occurred during the 1990s might have a disproportionate effect on the results. More empirical study on the cause and nature of the observed time-

<sup>16</sup> We see some temporary shocks in skewness and kurtosis, but the most sizeable shock is the stock market crash of October 1987. The shocks to skew and kurtosis five years later are because of this observation falling out of the sample.

variation is clearly needed. The graphs presented indicate that skewness and kurtosis are showing some convergence with developed market in the latter part of the 1990s.

As the cross-sectional variation of ERP in emerging markets is large, the effects of a successful reform in a specific market may be dwarfed on aggregate. Following Henry [2000] we can be specific in the dates for the first stock market liberalisation (Table 8) to test whether there is a significant change in the level before and following the date. Are investors rewarded in the transition process? In order to test for a structural difference in level of ERP we make some adjustment to ensure that we have a similar number of data point per country from the period proceeding and post liberalisations. For lack of sufficient data from proceeding the liberalisation date we omitted Malaysia, Philippines, Taiwan and Thailand from our study.

**Table 8: First stock market liberalisation.** This table is reprint of Table 1 (pp 534) of Henry [2000].

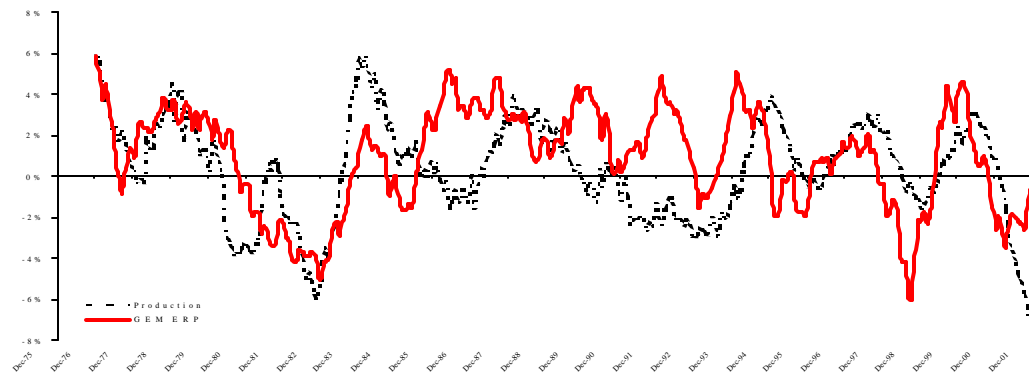
Country	Date of first stock market liberalisation
Argentina	November 1989
Brazil	March 1988
Chile	May 1987
Colombia	December 1991
Mexico	May 1989
Venezuela	January 1990
India	June 1986
Korea	June 1987
Malaysia	May 1987
Philippines	May 1986
Taiwan	May 1986
Thailand	January 1988

As with the aggregate data we cannot find unambiguous support supporting or rejecting the claim that liberalisation results in a change in ERP. In Korea we find a lower ERP in the subsequent period, but in Brazil the result is opposite and counterintuitive. In none of the markets were investors rewarded with an ERP over and above the return received for developed markets.

### Cyclical aspect on emerging market ERP

To test the hypothesis that time-variation in ERP is correlated with the global economic cycle, we examine the relation between changes in G7 industrial production and the ERP in emerging market. Figure 4 show that the correlation is evident, rising significantly above 0.5 in sub periods.<sup>17</sup>

**Figure 4: The business cycle and emerging market ERP.** The dashed line shows the yearly changes in G7 industrial production (OECD). The solid line gives the ERP in emerging markets after applying a twelve-month moving average filter.



The only period for which the correlation breaks down is in the early 1990s. Despite the global downturn, investors in emerging markets were rewarded. Better still, investors received an ERP over and above that of developed markets. Although we

<sup>17</sup> We do not display statistics, but note that the fit is better than the similar relation for G7 ERP and G7 industrial production. Secondly, there are noticeable differences in lag structure between period before 1990s and during the 1990s. Thirdly, using OECD leading indicators instead of actual production leads to an even better fit and similar conclusions.

couldn't find statistical evidence (in previous section) on structural changes determining changes in level of ERP, it is promising to note the disparity during this period quoted for structural changes. Something clearly happened.

In the cross-section of emerging markets, we find additional support for the correlation of the global economic cycle and ERP. For lack of sufficient data we omitted the Eastern European countries and studied only the major Latin American and Asian markets. Argentina, Mexico, Chile and Brazil show sizable correlation, which makes sense. Frankel and Roubini [2002] note that the recession among industrialized countries in 1980-1982 depressed prices and volumes for exports from emerging markets and contributed to the Latin American debt crisis. For Korea and India the correlation with the global cycle is also high but slightly less prominent, which is somewhat counterintuitive for economies that are export oriented. An explanation for the weaker link probably lies in the cause of the Asian crisis, which is thought to be more domestic. Whereas Asia was in a deep recession, the rest of the world managed to escape recession. The major central banks of the world successfully avoided contagion by lowering interest rates.

Obviously, it is not so easy to draw hard conclusions from these exercises. We have omitted other factors that might be of major importance to ERP in emerging markets, e.g. global interest rates and capital flows as suggested by Calvo, Leiderman and Reinhart [1993]. But at a minimum, our results seem to indicate that, on aggregate, the time variation in ERP is largely determined by changes in the economic business cycle. They have some form of explanatory power over their risk premium. Investors in emerging markets tend to be rewarded with high ERP during global economic expansions. Moreover, the rewards during such periods are substantially above the rewards received in developed markets. This hints that investors treat emerging markets as "high beta" markets.



#### **4. SUMMARY**

In this paper we test whether emerging markets carry a higher equity risk premium than developed markets. Using standard statistical techniques, we find statistically significant differences that investors should be able to exploit. However, downside risk reveals that this reward in emerging markets comes with severe risk in certain time periods. Results should be interpreted with caution, as both risk and return are dependent on the sample period taken. Finding conclusive results in studies with emerging markets is difficult. We observe cyclical time varying behaviour in the emerging market ERP data, but cannot claim the presence of a structural break in the data. The extent to which investors are rewarded in emerging markets tends to follow a pattern resembling the global business cycle.

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